

Games-based simulation in post-op recovery and rehabilitation

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Professor Bob Stone ([/staff/profiles/eece/stone-bob.aspx](#)), School of EECE, has been working with Intensive Care consultants **Professor Julian Bion** ([/staff/profiles/cem/MSE/bion-julian.aspx](#)) (also Dean of the UK Faculty of Intensive Care Medicine) and **Dr Tom Clutton-Brock** ([/staff/profiles/cem/MSE/Clutton-Brock-Tom.aspx](#)), (Head of the Department of Anaesthesia & Intensive Care), and, together with Dr Charlotte Small (ST5 Anaesthetics, studying for her MD and supervised by Julian and Bob), they are researching the potential for using games-based simulation in post-operative recovery and rehabilitation support.



One of Bob's Team's Virtual Restorative Environment systems has recently made its debut within the Intensive Care Unit, with a successful initial exposure to some of the patients and clinical staff, enabling his team to prepare for a more in-depth period of evaluation. Bob's team (including PhD and MPhil students Cheng Qian and Vishant Shingari) has also received a small grant from the **Royal Centre for Defence Medicine** (<http://www.uhb.nhs.uk/rcdm.htm>) to take their early research into amputee pain management. In addition, the team has just got the go-ahead to begin initial research on how real-time simulation can be used to help wean ICU patients off respirators earlier than is currently the case, thus enabling a faster transition to a normal ward environment.

These projects play to the multidisciplinary strengths of the School, as there is the need to design minimally intrusive techniques of electronically capturing the patient's breathing patterns and exercise outputs and linking those signals dynamically to a real-time weaning "game". An innovative concept for the "weaning game" has already been designed and is being worked on by an EECE MSc student, along with Bob's team. More recently, the team has successfully demonstrated a real-time interface, using the Microsoft Kinect, to record amputee stump movements and to use these to control a virtual pedalo in a 3D beach environment, with the aim of helping to minimise muscle atrophy prior to the fitment of prosthetic devices.

These developments will be reported later this month as part of Bob's Conference Opening Keynote at the prestigious **Laval Virtual event in France** (<http://www.laval-virtual.org/2013/?p=301&l=en>).